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(54) Improvements in or relating to
lavatory paper material

(57) Lavatory paper material comprises a first layer 10 of material of greater liquid permeability than the material of a second layer 11. The first layer 10 is liquid absorbent and soft and the second layer 11 liquid resistant. A third layer of material of greater liquid permeability than the second layer may be on the opposite side of the second layer to the first layer. The layers may be embossed, and may be held together by adhesive. The material may be fibres or plastics. The first layer may be liquid absorbent paper. The second layer may be grease-proof paper. The lavatory paper material resists transmission of faecal bacteria to the hand of a user.

ERRATUM

SPECIFICATION NO 2085356A

Page 3, line 28, *after sheets. start new paragraph insert*

New claims & amendments to claims filed on 16 December 1981
Superseded claims 15-17
New or amended claims :-

15. Lavatory paper material as claimed in claim 1 or claim 2, in which the second layer becomes more permeable after a period of time.
16. Lavatory paper material as claimed in claim 1 or claim 2, in which the second layer is removable by water.
17. Lavatory paper material as claimed in claim 1 or claim 2, in which the second layer is soluble in water.
18. Lavatory paper material as claimed in claim 15 or claim 16 or claim 17, in which the second layer comprises wax.
19. Lavatory paper material substantially as hereinbefore described with reference to Fig. 1, or Fig. 3, or Fig. 6, or Fig. 10, or Fig. 13, of the accompanying drawings.
20. Lavatory paper material as claimed in any preceding claim formed into a roll.
21. Lavatory paper material as claimed in any of claims 1 to 19 formed into a pack of sheets.

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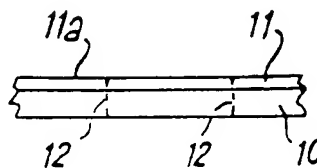
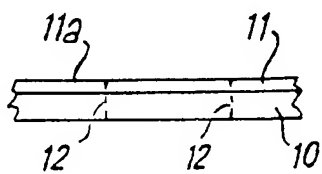
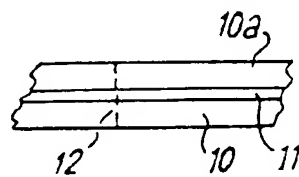
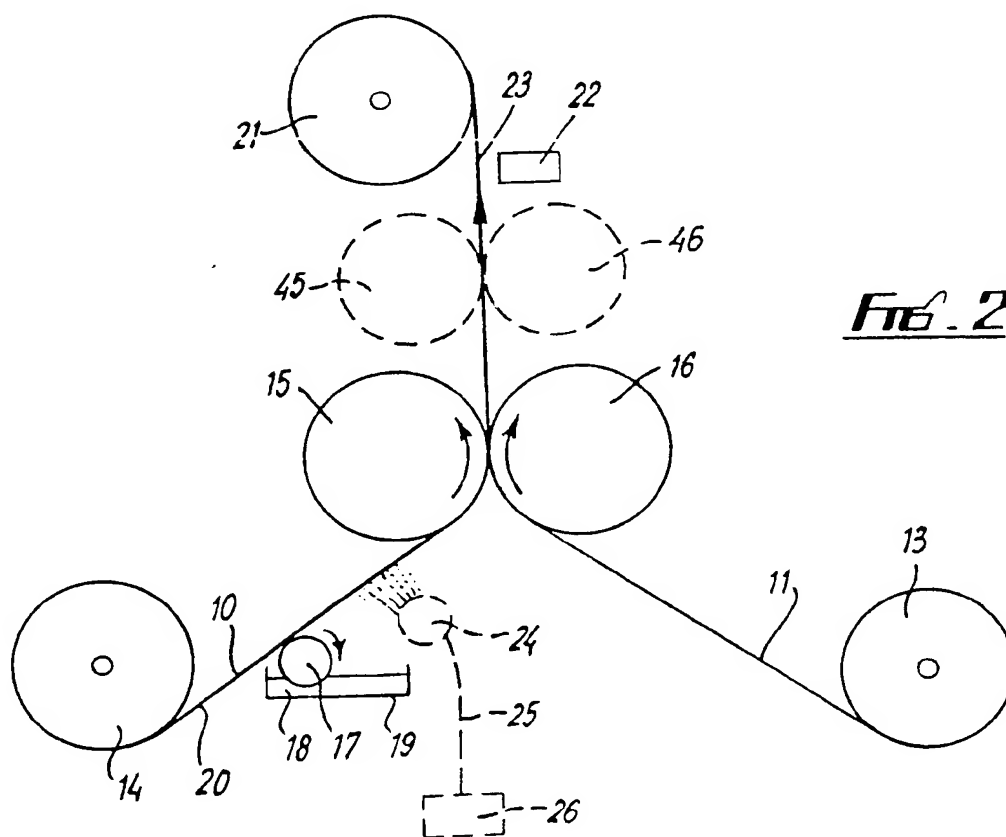
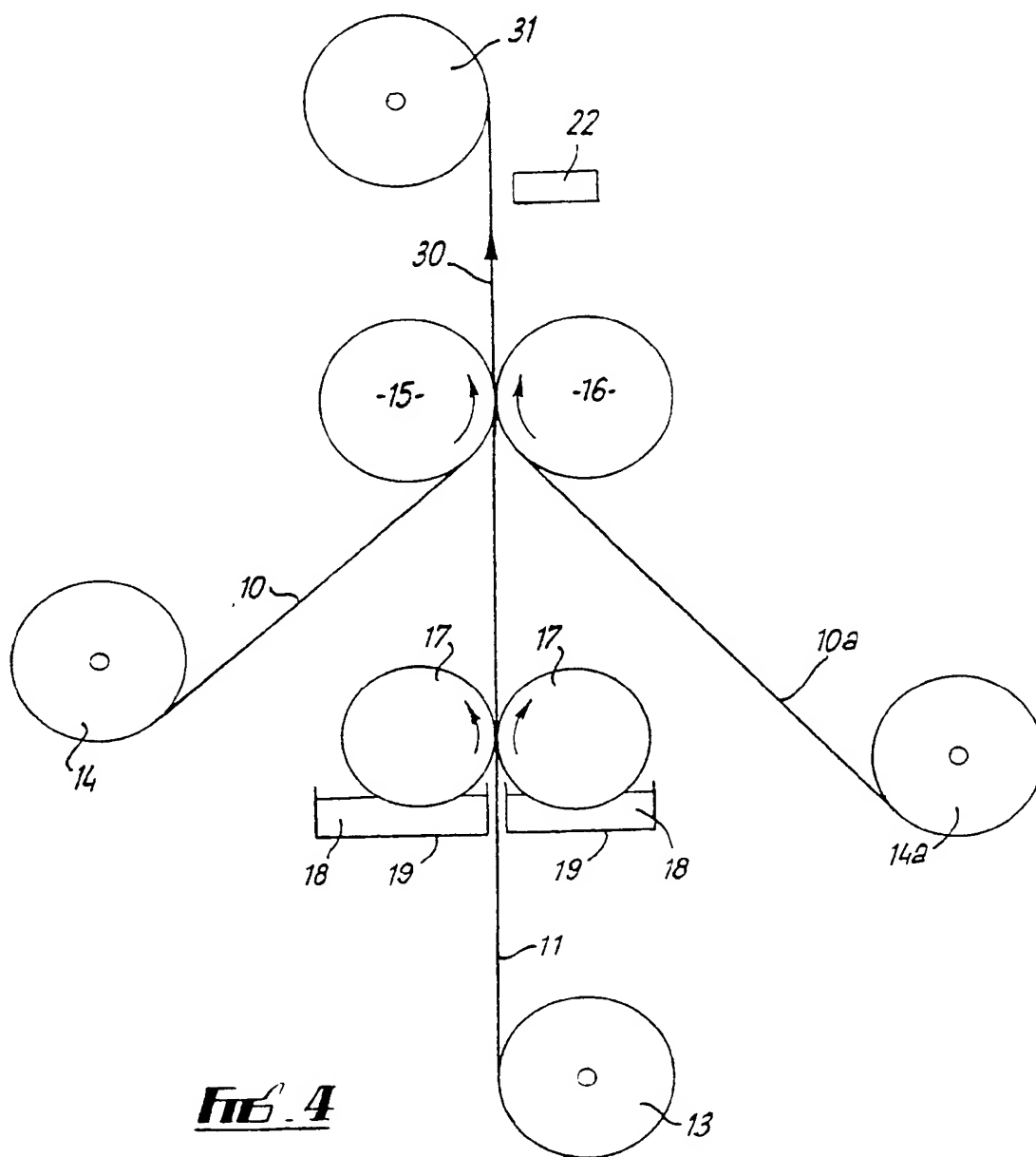
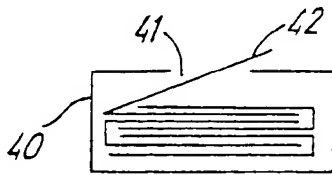
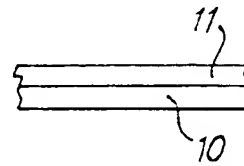
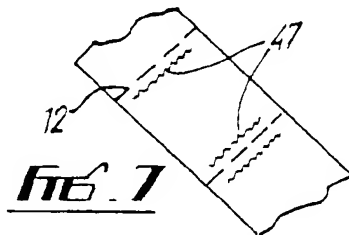
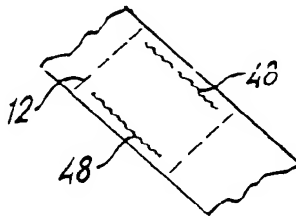
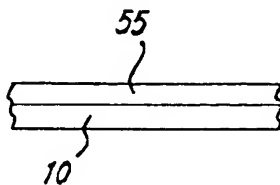
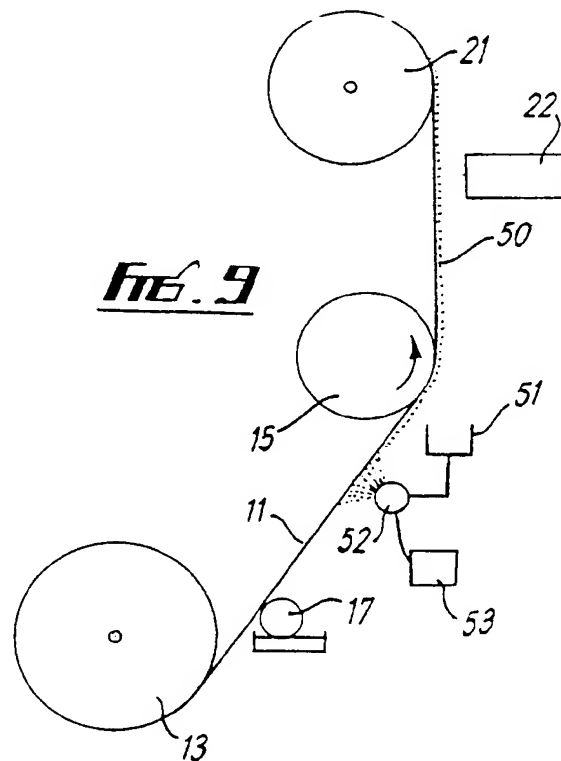


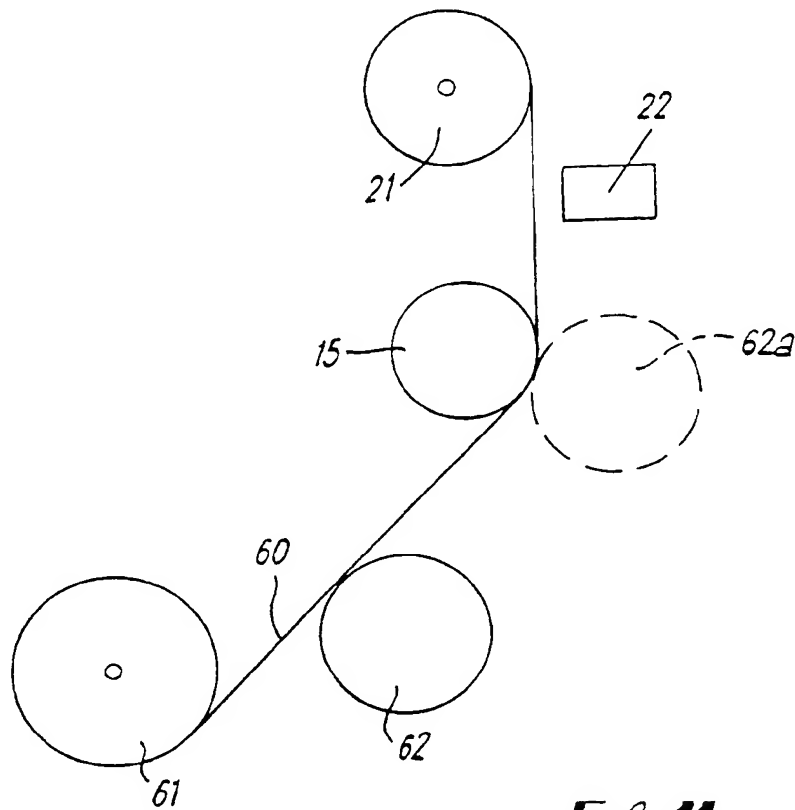
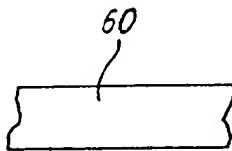
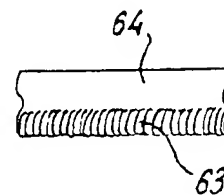
FIG. 1

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FIG. 1FIG. 3FIG. 2

**FIG. 4**

**FIG. 5****FIG. 6****FIG. 7****FIG. 8****FIG. 10****FIG. 9**

**FIG. 11****FIG. 12****FIG. 13**

SPECIFICATION

Improvements in or relating to lavatory paper material

- 5 This invention relates to lavatory paper material.
- Lavatory or toilet paper is used in wiping the rectal area after defaecation and conventionally is of the so-called soft, absorbent tissue, or creped paper; or the so-called hard or smooth finish type or uncreped paper.
- 10 It is desirable that the transmission of faecal bacteria through the paper to a user's hand be as little as possible.
- 15 According to one aspect of the invention lavatory paper material comprises a first layer of material and a second layer of material, the first layer of material having greater liquid permeability than the second layer material.
- 20 According to another aspect of this invention lavatory paper material comprises a first layer of liquid absorbent material and a second layer of liquid resistant material.
- The term lavatory paper material is to be understood in a broad sense and is not limited to cellulose-based material; it includes material made from fibres or plastics, and is to be understood as referring to material for use in wiping the rectal or anal area.
- 30 The second layer may for example be grease-proof paper.
- The first layer may be liquid absorbent paper.
- The first and second layers may be of different colours.
- 35 The first layer can itself be formed from two superposed layers of liquid absorbent paper.
- The first layer and/or second layer could be embossed, for example with a regular array of spaced depressions.
- 40 In one form the second layer is roughened or otherwise treated on its outer surface to improve the grip.
- In one arrangement the layers are held together by adhesive.
- 45 In one arrangement the second layer may take the form of or comprise resin or plastics material or wax applied to the first layer.
- In another embodiment, the lavatory paper material comprises a third layer of material on the opposite side of the second layer to the first layer and of material having greater liquid permeability than the second layer.
- The first and third layers could be of the same material.
- 55 The two layers may be formed by treating one side of a length of material to make it of a different permeability to the other side. For example a length of relatively impermeable material may be treated on one face to loosen the fibres of part of the thickness of the material to form a layer more permeable than the layer formed by the remaining thickness.
- 60 In one form the invention comprises a layer of particles or fibres applied, for example by blowing, on to one face of the second layer to form the first,

more permeable, layer. The one face would be coated with an adhesive.

- The invention from another aspect also includes such lavatory paper material formed into a roll, or a pack of sheets. It will be appreciated that the material in roll would have a series of longitudinally spaced transverse rows of perforations enabling it to be readily separated into individual pieces for use. In the pack, a plurality of pieces are generally superposed, often interfolded so that extraction of one piece from the pack causes a part of the next piece to protrude from the pack.
- 70 A user may use more than one piece at a time, the first layer being nearer to the body.
- 80 It will be appreciated that the first layer is preferably soft which is more pleasant for the user than hard less permeable paper or material.
- The invention may be performed in various ways and some specific embodiments with possible modifications will now be described by way of example with reference to the accompanying diagrammatic drawings, in which:-
- 85 *Figure 1* is a side view of lavatory paper material; *Figure 2* is a side view of apparatus for forming the material;
- 90 *Figure 3* is a side view of another embodiment; *Figure 4* is a side view of apparatus for forming the material of *Figure 3*;
- Figure 5* shows a pack of sheets;
- 95 *Figures 6 and 7* show another form of lavatory paper material;
- Figure 8* is a modification of *Figure 7*;
- Figure 9* shows apparatus for making a further form of lavatory paper material;
- 100 *Figure 10* is a view similar to *Figure 1* of another form of lavatory paper;
- Figure 11* shows apparatus for making a further form; and
- Figures 12 and 13* show material before and after treatment in the apparatus of *Figure 12*.
- 105 Referring to *Figures 1, 2* the paper comprises a first layer 10 of water-absorbent paper adhered to a second layer of water-resistant paper in the form of grease-proof paper for example as used in domestic baking. Other forms of grease-proof paper may be used. The layer 10 may for example be paper as conventionally used in kitchen rolls or conventional soft lavatory paper, sometimes referred to as creped paper or soft tissue. The layer 10 could itself be of two-layers of absorbent material. It will be appreciated that the water absorbent paper has more water permeability than the water-resistant paper.
- The paper may be in separate sheets or in a long length with longitudinally spaced transverse rows of perforations 12.
- 120 In *Figure 2* a roll 13 of grease-proof paper 11 and a roll 14 of water-absorbent paper 10 are rotatably mounted in a frame (not shown) and the respective papers 11, 10 are drawn off the rolls by feed rollers 15, 16 mounted in the frame for rotation and driven in known manner by suitable means such as an electric motor.
- One surface 20 of paper 10 is in engagement with a rotatable roll 17 arranged to dip into a suitable liquid adhesive 18 in a bath 19 and transfer adhesive
- 130

to the paper 10. The papers 10, 11 are joined together as they pass between the feed rolls and are wound up on roll 21. A device 22 is arranged to produce the rows 12 of perforations in known manner. Alternatively the assembled paper 23 can be drawn off the roll 21 and cut by a knife into separate pieces which are formed into flat packs in known manner. An example of a flat pack is shown in Figure 5, in which a paper holder 40 has an opening 41 in one side and the pieces 42 are interfolded so that extraction of one piece 42 causes a part of the next piece to protrude through the opening.

The roller 17 could be in the form of a brush.

Instead of roll 17, the adhesive could be sprayed on sheet 10 by nozzle 24 receiving the adhesive through line 25 from source 26 through a pump (not shown).

In one arrangement the more impermeable layer takes the form of a thin layer or application of resin or plastics, for example sprayed on to the layer 10, for example using a spray device similar to 24, 25, 26. It is thought that melamine is suitable.

In a further embodiment the less permeable, possibly impermeable, layer is formed by wax having a transient impermeability but which is permeable after a time. A water-soluble wax could be used, sprayed or otherwise applied to layer 10, for example at 55 Figure 10.

In one arrangement the length of roll 21 is equal to the length of several conventional rolls of toilet paper, and the paper is drawn off roll 21, passed through slitters to slit it into conventional lengths, and wound up into rolls.

The adhesive could be applied to paper 11 rather than paper 10.

In one embodiment the layer 10 is conventional soft paper tissue and the layer 11 conventional hard or smooth finish lavatory paper.

The grip on the exterior surface 11a Figure 1, which is possibly shiny, of the less permeable layer could be improved by dimpling, ridging or roughening. The paper 11 could be crinkled to improve the grip.

The layers 10, 11 could be of different colours to assist in identification. For example a dye or other colouring material, non-toxic, could be used. An antiseptic and/or bacteriostatic material could be included if thought appropriate to maintain the paper sterile or hygienic before use.

The lavatory paper of Figure 3 has an additional layer 10a of water-absorbent paper, for example the same as layer 10, adhered to the other side of layer 11.

In the apparatus of Figure 4, generally similar to that of Figure 3, the material of layers 10, 11, 10a is drawn by feed rolls 15, 16, from rotatable rolls 14, 13, 14a. The two sides of paper 11 are coated with adhesive by coating rolls 17 and the assembled lavatory paper is wound into roll 31. Additional feed and guide rolls could be used if required. Again, brushes or spray devices could be used to apply the adhesive.

The paper of Figure 3 can be used with either layer 10 or 10a nearer the body and the layer further from

the body may provide an improved grip.

Additionally or alternatively the rolls 13, 14, 21 or 13, 14, 14a, 31 could be driven.

In the embodiment of Figure 6 the adhesive is omitted and if desired the layers 10, 11 are held together by embossing or deforming the two layers, for example using embossing rollers 45, 46 Figure 1. The embossing could be parallel to the perforations 12 at the ends of each piece as shown at 47 Figure 7 or parallel to the sides as shown at 48 Figure 8. In one form the device 22 for perforating is arranged also to emboss.

In the arrangement of Figure 9 adhesive is applied to the less permeable layer 11 and small particles of paper fibre or plastics fibres, of an absorbent, soft nature are blown onto the adhesive to form a soft more permeable layer 50. Fibres are contained in a hopper 51 and a blower 52 blows them on to layer 10 using air under pressure from source 53.

In one embodiment a sheet of paper or other material is soft and permeable on one side and relatively impermeable on the other side, to form the less and more permeable layers. For example as shown in Figure 11 a fairly thick relatively impermeable paper 60 having fibres closely packed together is taken from roll 61 and one surface is scratched or otherwise treated by projecting means on the surface of a rotatable roller 62. The surface 63 produced by this is rough compared with the surface 64 on the other side but is also softer and more absorbent and more permeable. In a modification shown dotted at 62a the roller 62 is positioned to form a nip with feed roller 15.

The wet and dry bursting strengths of the lavatory paper material are preferably at least 350 grams per sq.cm. (5 lb. per sq.in.).

CLAIMS

1. Lavatory paper material comprising a first layer of material and a second layer of material, the first layer material having greater liquid permeability than the second layer material.

2. Lavatory paper material comprising a first layer of liquid absorbent material and a second layer of liquid resistant material.

3. Lavatory paper material as claimed in claim 1 or claim 2, in which the second layer is grease-proof paper.

4. Lavatory paper material as claimed in any preceding claim, in which the first layer is one or more layers of liquid absorbent paper.

5. Lavatory paper material as claimed in any preceding claim, in which the first and second layers are of different colour.

6. Lavatory paper material as claimed in any preceding claim, in which the first and/or second layer is embossed.

7. A lavatory paper material as claimed in any of claims 1 to 5, in which the outer surface of the second layer is roughened.

8. Lavatory paper material as claimed in any preceding claim, comprising a third layer of material on the opposite side of the second layer to the first layer and of material having greater liquid permea-

bility than the second layer.

9. Lavatory paper material as claimed in any preceding claim, in which the layers are held together by adhesive.

5 10. Lavatory paper material as claimed in any of claims 1 to 8, in which the second layer comprises resin or plastics material or wax.

11. Lavatory paper material as claimed in any of claims 8 to 10, in which the first and third layers are
10 of the same material.

12. Lavatory paper material as claimed in any of claims 1 to 7, in which the second layer is one side of a length of material.

13. Lavatory paper material as claimed in claim
15 12, comprising a length of paper the fibres of part of the thickness being looser than the remainder to form the second layer.

14. Lavatory paper material as claimed in any preceding claim, in which the second layer is
20 impermeable.

15. Lavatory paper material substantially as hereinbefore described with reference to Figure 1, or Figure 3, or Figure 6, or Figure 10, or Figure 13, of the accompanying drawings.

25 16. Lavatory paper material as claimed in any preceding claim formed into a roll.

17. Lavatory paper material as claimed in any of claims 1 to 15 formed into a pack of sheets.

